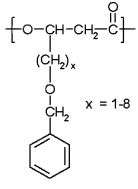
B. Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1-20. (Cancelled)

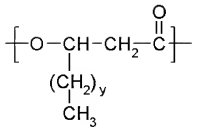
21. (Currently Amended) A polyhydroxyalkanoate comprising a monomer unit of 3-hydroxy-ω-[(phenylmethyl)oxy]alkanoic acid expressed by chemical formula (1):



(1),

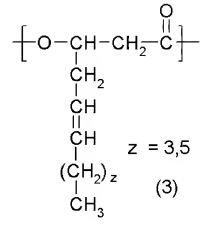
wherein x ~~can be~~is one or more integers within the range shown in the chemical formula (1).

22. (Currently Amended) The polyhydroxyalkanoate according to claim 21, comprising at least one unit expressed by a chemical formula selected from the group consisting of chemical formulas (2) and (3):



y = 1-8

(2)

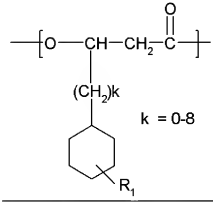


z = 3,5

(3)

wherein y and z ~~can be~~are one or more integers within the range shown in the chemical formulas (2) and (3), while being independent from the monomer unit expressed by the chemical formula (1).

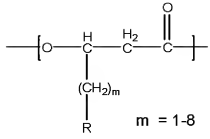
23. (Currently Amended) The polyhydroxyalkanoate according to claim 21, comprising simultaneously, in at least a molecule thereof, the monomer of 3-hydroxy-ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (1) and (i) a 3-hydroxy-ω-cyclohexylalkanoic acid unit expressed by chemical formula (5) or (ii) a unit expressed by chemical formula (4):



k = 0-8

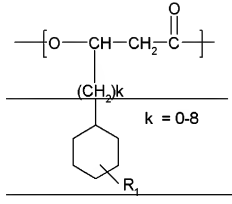
(5),

wherein R_1 is H, CN, NO_2, halogen, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5, and C_3F_7, and k is one or more integers within the range shown in the chemical formula (5);



(4),

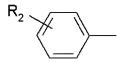
wherein m ~~can be~~is one or more integers within the range shown in the chemical formula (4), and R ~~comprises a residue having either a phenyl structure or a thienyl structure, or a 3-hydroxy-ω-cyclohexylalkanoic acid unit expressed by chemical formula (5):~~



~~(5),~~

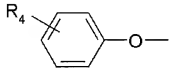
~~wherein R_1 is H, CN, NO_2, halogen, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5, and C_3F_7, and k can be one or more integers within the range shown in the chemical formula (5),~~

~~wherein R in chemical formula (4)~~ is at least one group selected from the group consisting of residues (8)-(17):



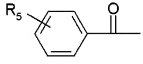
(8),

wherein R_2 is H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $CH{=}CH_2$, CF_3, C_2F_5, C_3F_7, and $COOR_3$, where R_3 represents any one selected from the group consisting of H, Na, and K, and in a case where there exist a plurality of units, R_2 may be different for each unit;



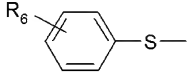
(9),

wherein R_4 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, SCH_3, CF_3, C_2F_5, and C_3F_7, and in a case where there exist a plurality of units, R_4 may be different for each unit;



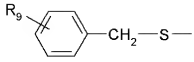
(10),

wherein R_5 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5, and C_3F_7, and in a case where there exist a plurality of units, R_5 may be different for each unit;



(11),

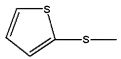
wherein R_6 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_7$, and SO_2R_8, where R_7 represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_8 represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_6 may be different for each unit;



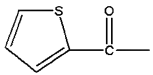
(12),

wherein R_9 represents a substituent group on the aromatic ring, R_9 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{10}$, and SO_2R_{11}, where R_{10} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{11} represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_9 may be different for each unit;

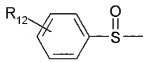
(13);



(14);



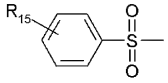
(15);



(16),

wherein R_{12} is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{13}$, and SO_2R_{14}, where R_{13} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{14} represents

any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_{12} may be different for each unit; and

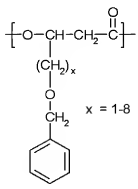


(17),

wherein R_{15} is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{16}$, and SO_2R_{17}, where R_{16} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{17} represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_{15} may be different for each unit.

24. (Previously Presented) The polyhydroxyalkanoate according to claim 21, wherein a number average molecular weight is within the range between 1000 and 1000000.

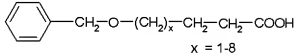
25. (Currently Amended) A method for producing a polyhydroxyalkanoate comprising, in a molecule thereof, a 3-hydroxy-ω-[(phenylmethyl)oxy]alkanoic acid monomer unit expressed by chemical formula (1):



(1),

wherein x ~~can be~~is one or more integers within the range shown in the chemical formula (1),

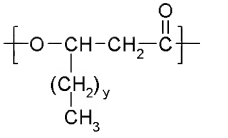
the method comprising ~~allowing~~ contacting a microorganism of one or more strains selected from the group consisting of *Pseudomonas cichorii* YN2 (FERM BP-7375), *Pseudomonas cichorii* H45 (FERM BP-7374), and *Pseudomonas jessenii* P161 (FERM BP-7376) ~~to biosynthesize the polyhydroxyalkanoate from~~ with an ω-[(phenylmethyl)oxy]alkanoic acid expressed by chemical formula (19) in a medium to biosynthesize the polyhydroxyalkanoate:



(19),

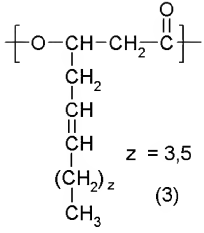
wherein x ~~can be~~is one or more integers within the range shown in the chemical formula (19) as a raw material ~~under a condition, which comprises the ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (19)~~.

26. (Currently Amended) The method for producing a polyhydroxyalkanoate according to claim 25, wherein the polyhydroxyalkanoate comprises at least one unit expressed by chemical formulas (2) and (3):



y = 1-8

(2)

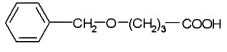


z = 3,5

(3)

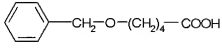
wherein y and z ~~can be~~is one or more integers within the range shown in the chemical formulas (2) and (3), while being independent from the unit expressed by the chemical formula (1).

27. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 25, wherein the ω-[(phenylmethyl)oxy]alkanoic acid expressed by said chemical formula (19) is 4-[(phenylmethyl)oxy]butyric acid expressed by chemical formula (23):



(23)

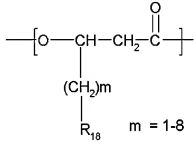
or 5-[(phenylmethyl)oxy]valeric acid expressed by chemical formula (24):



(24).

28. (Currently Amended) The method for producing a polyhydroxyalkanoate according to claim 25, comprising allowing the microorganism to

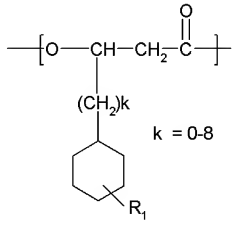
biosynthesize a polyhydroxyalkanoate comprising simultaneously, in at least a molecule thereof, the monomer unit of 3-hydroxy-ω-[(phenylmethyl)oxy]alkanoic acid expressed by chemical formula (1) and (i) a 3-hydroxy-alkanoic acid unit expressed by chemical formula (22) or (ii) a 3-hydroxy-ω-cyclohexylalkanoic acid unit expressed by chemical formula (5):



(22),

wherein m ~~can be~~is one or more integers within the range shown in the chemical formula (22), and R_{18} comprises a residue having either a phenyl structure or a thienyl structure;~~, or~~

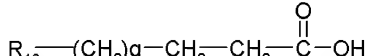
~~a 3-hydroxy-ω-cyclohexylalkanoic acid unit expressed by chemical formula (5):~~



(5),

wherein R_1 is selected from the group consisting of H, CN, NO_2, halogen, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5 and C_3F_7, and k can be one or more integers within the range shown in the chemical formula (5),

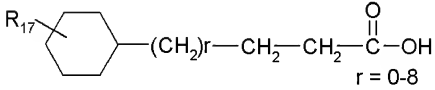
by contacting, in the medium, the microorganism with~~from~~ the ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (19) and (i) an alkanoic acid expressed by chemical formula (20) or (ii) an ω-cyclohexylalkanoic acid expressed by chemical formula (21):



(20),

wherein q ~~can be~~is one or more integers within the range shown in the chemical formula (20), and R_{16} comprises a residue having either a phenyl structure or a thienyl structure~~;~~ ~~or~~

~~ω-cyclohexylalkanoic acid expressed by chemical formula (21):~~

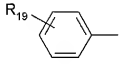


(21),

wherein R_{17} is selected from the group consisting of H, CN, NO_2, halogen, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5, and C_3F_7, and r ~~can be~~is one or more integers within the range shown in the chemical formula (21) ~~as raw materials under a condition, which comprises ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (19)~~

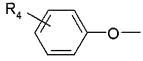
~~and alkanoic acid expressed by the chemical formula (20) or ω-cyclohexylalkanoic acid expressed by the chemical formula (21), ;~~

wherein R_{16} in the chemical formula (20) and R_{18} in the chemical formula (22) are, independently, at least one group selected from the group consisting of residues (9)-(17) and (25):



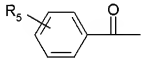
(25),

wherein R_{19} is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $CH{=}CH_2$, CF_3, C_2F_5, and C_3F_7, and in a case where there exist a plurality of units, R_{19} may be different for each unit;



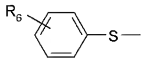
(9),

wherein R_4 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, SCH_3, CF_3, C_2F_5, and C_3F_7, and in a case where there exist a plurality of units, R_4 may be different for each unit;



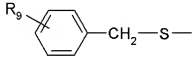
(10),

wherein R_5 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, CF_3, C_2F_5, and C_3F_7, and in a case where there exist a plurality of units, R_5 may be different for each unit;



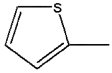
(11),

wherein R_6 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_7$ and SO_2R_8, where R_7 represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_8 represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_6 may be different for each unit;

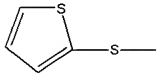


(12),

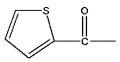
wherein R_9 is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{10}$, and SO_2R_{11}, where R_{10} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{11} represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_9 may be different for each unit;



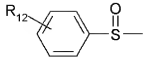
(13);



(14);

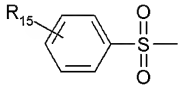


(15);



(16),

wherein R_{12} is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{13}$, and SO_2R_{14}, where R_{13} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{14} represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_{12} may be different for each unit; and



(17),

wherein R_{15} is selected from the group consisting of H, halogen, CN, NO_2, CH_3, C_2H_5, C_3H_7, $(CH_3)_2$-CH, $(CH_3)_3$-C, $COOR_{16}$, and SO_2R_{17}, where R_{16} represents any one selected from the group consisting of H, Na, K, CH_3, and C_2H_5, and R_{17} represents any one selected from the group consisting of OH, ONa, OK, halogen, OCH_3, and OC_2H_5, and in a case where there exist a plurality of units, R_{15} may be different for each unit.

29. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 25, wherein the microorganism is cultured in a medium containing the ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (19).

30. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 28, comprising culturing the microorganism in

a medium containing the ω-[(phenylmethyl)oxy]alkanoic acid expressed by the chemical formula (19) and the alkanoic acid expressed by the chemical formula (20) or the ω-cyclohexylalkanoic acid expressed by the chemical formula (21).

31. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 29, wherein said medium contains at least one selected from the group consisting of peptides, yeast extract, organic acids or salts thereof, amino acids or salts thereof, saccharides, and straight-chain alkanoic acids, which are saturated or unsaturated fatty acids having 4 to 12 carbon atoms or salts thereof.

32. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 31, wherein the peptide is polypeptone; the organic acids or salts thereof are one or more compounds selected from the group consisting of pyruvic acid, oxaloacetic acid, citric acid, isocitric acid, ketoglutaric acid, succinic acid, fumaric acid, malic acid, lactic acid, and salts thereof; the amino acids or salts thereof are one or more compounds selected from the group consisting of glutamic acid, aspartic acid, and salts thereof; and the saccharides are one or more compounds selected from the group consisting of glyceroaldehyde, erythrose, arabinose, xylose, glucose, galactose, mannose, fructose, glycerol, erythritol, xylitol, gluconic acid, glucuronic acid and galacturonic acid, maltose, sucrose, and lactose.

33. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 29, wherein the culturing of the microorganism comprises two or more culturing steps.

34. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 33, wherein the culturing is performed by a fed-batch culture.

35. (Previously Presented) The method for producing a polyhydroxyalkanoate according to claim 29, comprising a step of recovering the polyhydroxyalkanoate comprising the 3-hydroxy-ω-[(phenylmethyl)oxy]alkanoic acid unit expressed by the chemical formula (1) generated by the microorganism from cells of the microorganism.

36-37. (Cancelled)